DOCUMENT RESUME

ED 267 805 IR 051 466

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TITLE University Library Experience with Remote Access to Online Catalogs.
PUB DATE Nov 85
NOTE 39p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Libraries; Foreign Countries; Higher Education; Library Automation; *Library Catalogs; Library Research; *Library Services; Library Statistics; Library Surveys; Microcomputers; *Online Systems; *Research Libraries; Use Studies
IDENTIFIERS Canada; *Online Catalogs; United States

ABSTRACT

To investigate the experience of American and Canadian university libraries with remote access catalogs, self-administered questionnaires were sent to the 137 directors of all Association of Research Libraries (ARL) libraries and all libraries of Canadian degree-granting institutions. The study was designed to: (1) survey Canadian and U.S. academic libraries which allow remote access to their online catalogs or online catalog substitutes; (2) discover changes in library use patterns and library service demands by remote access terminal/personal computer users; and (3) determine the number of users and whether this has changed over time. The questionnaire was made up of 20 questions covering such aspects of remote access as the number of patrons who can log-on at the same time, the hours of service, time limitations on individual use, patron demand for additional service, and changes in level of patron satisfaction with the service already provided. This report describes remote access facilities and services at the early stage of their development, and also indicates some of the problems in collecting data. The questionnaire and a number of tables are appended. (THC)

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UNIVERSITY LIBRARY EXPERIENCE WITH REMOTE ACCESS TO ONLINE CATALOGS

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November 1985

IR051466

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ABSTRACT

A study to investigate the experience of American and Canadian university libraries with remote access catalog users. Questionnaires were sent to ARL libraries and all Canadian university libraries. Thirty-two libraries (27.8% of 115 respondents) reported that they offer remote access facilities; only five (7.6% of 66 respondents) of ARL/CARL libraries reported no plans for introduction of remote access facilities in near or not too distant future.

The number of ports for remote access ranges from one to over 300, but for sixty-three % of respondents (17 of 27 libraries), the average number of ports is 4.53. Almost all libraries intend to increase the number of their ports. The hours of service for remote access are the same as those available for in-library use, or longer, i.e., sixteen to twenty-four hours. Most libraries impose no time limitations on patrons' remote access catalog searches. Most libraries provide the same information for remote access patrons as they provide for in-library patrons. A few do not yet provide circulation information. Most libraries estimated that ninety to ninety-nine percent of remote access patrons are campus users, the university's own clientele rather than users from other institutions or farther away. Remote access appears to have produced no major effect on libraries so far. There is the general demand for more, in the case of remote access, more ports, and five libraries reported requests for document delivery (another three already provide document delivery). No library could see any relationship between increases or decreases in circulation and interlibrary loans and the introduction of remote access facilities.

The most difficult data to collect was the data on the amount of remote access use, i.e., session lengths and numbers of sessions. Most libraries do not keep these statistics, and if they do, they do not distinguish between in-library and remote access catalog users. The average length of sessions reported for all online catalog patrons and for remote access patrons falls in the same range; estimated times: 3, 3-5, 4, 10, 20 minutes; actual times: 9:17, 11, 11:22, 11:53 minutes. Eleven libraries responded to the question about number of user sessions, but most could give little information , especially comparative information. One library did give estimates that showed a decline in remote access use over three years. The only other library which gave comparative figures for users' remote access activity (transactions) showed an increase in this activity over three to four years.

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The researchers wish to acknowledge the valuable assistance of Margaret Beckman, Executive Director for Information Technology, University of Guelph, in questionnaire design.

INTRODUCTION

While it is a commonplace now that automation of library catalogs is bringing about significant change in the provision of services within the library's walls, little research attention has been paid to the potential advantages and difficulties associated with access to library online catalogs by users using terminals or computers located outside the library system. Every survey of library users has shown that users want, and expect, to have such access from their offices, from their homes, from "everywhere".

The idea of remote access itself is not new. The immobility of early chained books gave way with the invention of printing to remote access in the form of portable publications in multiple copies; printed catalogues allowed readers to discover what the library held without their having to visit it. The card catalogue did not advance this tendency certainly but as Brian Aveney succinctly has observed:

> Long before the personal computer, librarians were figuring out ways to provide remote access to the catalog. In addition to the printed book catalog, whether typeset or computer produced, librarians have provided telephone inquiry services, lists of new titles, topical bibliographies, and copies of microform catalogs at remote locations. In some cases all or a portion of the card catalog was duplicated. Card catalogs of major libraries or notable special collections have been "shingled" to produce a variant of the book catalog.[1]

Now it is expected that online public access catalogs (OPACs) which can be searched from remote locations by means of personal computers or terminals will replace traditional catalogs. Kilgour claims that these OPACs "will enlarge availability of information to individual users wherever they may be, while at the same time reducing users' costs to obtain information and institutional costs in maintaining and augmenting catalogs."[2] Users' costs may be reduced but not necessarily institutional costs. An analogy may serve as an example: when the London Public Library introduced a union catalog showing the resources of both main and branch libraries - thus providing "remote access" to total public library resources for branch users - there was a noticeable increase in demand for transfer of materials between branches, so much so that staff costs for dealing with these transfers increased and the purchase of an additional truck was requested.[3] The effects on public service departments in academic libraries as more and more users access the library's catalog from remote locations are, as yet, unmeasured. Even anecdotal information is skimpy.

It is reasonable to expect that librarians should consider such possible consequences of remote access as increased (or decreased) demand, higher (or lower) costs, and possibly some change in the level of patron satisfaction or dissatisfaction with the library's service. No studies have been published on this subject.

The research study reported here was funded by a PETREL grant from the Council on Library Resources and was undertaken as a joint effort of University of Western Ontario library staff and library school faculty to find data from the experience of others which could serve as background information in the library's planning for remote access to the U.W.O. online public catalog.

BACKGROUND

The University of Western Ontario is a medium sized university, located in southwestern Ontario. The university library, which is a member of the Association of Research Libraries, is actually a system of libraries. The D.B. Weldon Library - a new building opened in 1972 - is the main library, and there are six divisional/professional libraries holding specialized collections in business, education, engineering, law, music and sciences. The total library collection contains over 1,400,000 volumes, almost 1,300,000 microforms, and 21,000 current serials as well as other materials such as scores and audiovisual media.

The University of Western Ontario was a forerunner in the move to automate library processes, and the introduction of its online catalog in September 1985 "marks the culmination of more than ten years of systems development and file conversion work in the UWO Library System, as well as the beginning of a new era of automated management of bibliographic information".[4]

The UWO card catalog was closed in September 1979 and replaced by a microfiche union catalog. In September 1981 the Library installed the GEAC online circulation system; a Public Query subsystem added to this circulation module allowed users to search the circulation database by author, title, subject, and call number, and patrons used the Online Public Query facility as they would an online catalog.

> As a replacement for the Public Query System, which has provided access only to our Circulation System data base, the Online Catalogue will at its onset access a data base of some 900,000 fully catalogued, machine-readable records. This will give UWO one of the largest online automated catalogues among North American academic libraries. Noteworthy features include improved response time, more access points to the Libraries monographic holdings, and better designed screen displays. Potential future enhancements include the addition of cross-references, remote access to the Catalogue through the University communication network, and keyword indexing.
>
> The Online Catalogue will be the user's key to the Library System's integrated online system, altogether composed of an Acquisition System, a Cataloguing System, a Circulation System, and the Online Catalogue.[5]

The system is operated by two GEAC 8000 mini-computers. Ready access to more than 900,000 items is provided through thirty-eight terminals located in the D.B. Weldon Library and the Business, Education, Engineering, Law, Music, and Health Sciences libraries. Users are able to conduct searches under author, title, call number, subject heading, or a combination of author's name and title of the work.

At the end of this year, the UWO Library will undertake a pilot study of remote access facilities, on a limited basis, in campus offices.

The School of Library and Information Science as well as three colleges associated with the University are not part of the UWO Library system and do not have electronic access to the new online catalog although their students and faculty are university borrowers. These institutions purchase copies of D.B. Weldon Library's microfiche union catalog (but not every updated version). Weldon Library's decisions about remote access facilities will have to take into consideration potential demands from these institutions as well as from the local public library, the local community college, and local special libraries.

ONLINE CATALOGS - SYSTEM CONFIGURATIONS AND REMOTE ACCESS LINKS

Online catalogs exist in a wide variety of system configurations with different software, different hardware and different telecommunications links.

Online catalogs may:

(1) have been developed in-house by the library's own staff or by the local university's computer staff. Libraries developing their own software may acquire their own hardware or may use the university's computing center's hardware. Examples of such systems are the University of California's MELVYL, Northwestern University's LUIS or NOTIS, Virginia Tech's VTLS.

(2) be based on systems developed by another library such as those listed above. The software for these systems is purchased and run on the purchasing library's own computer or its university's campus network computer. Examples are: VTLS used by the University of Alabama, NOTIS used by the University of Florida.

(3) have been developed as a shared network project such as the Bibliographic Information System (BIS) being developed by Duke University, the University of North Carolina and North Carolina State University.

(4) be linked to one of the bibliographic utilities in various forms. For example, OCLC's local library system LS/2000 has three hardware options: a minicomputer-based system (either institution-owned or timeshared) and a microcomputer-based package.

(5) be purchased from a commercial vendor such as GEAC, CLIS, DataPhase, Biblio-Techniques, etc. Integrated library systems typically have been developed from a vendor's turnkey circulation system to a library's customized requirements. Libraries use the vendor's specialized hardware as well as software.

The differences in online catalog configurations: software, hardware, telecommunication links are important to note when studying remote access facilities.

Perhaps the most important difference to note is whether remote access to the catalog is made through the university's central shared computer or through the library's own dedicated computer.

Basically there are two forms of remote links to an online catalog. The first form consists of "hardwired","dedicated", "direct feed" lines between terminals and computers. These may be local area networks (LANs). The second form is dial-up access. Patrons dial up the catalog using a modem to make the connection between the online catalog and their "remote" terminals or computers. In some cases,the library has no control over this access:

> We have no public terminals - all are operated by library staff. However, we do have a telephone number whereby callers with a modem may connect to the circulation inquiry function. We don't advertise the telephone number, but other libraries know it, and some individuals may use it - we have no way of knowing.

If the online catalog is part of the whole university computer system, there may be no distinction between terminals inside or outside the library. All campus terminals hardwired to the university campus computer are hardwired also to the library catalog; all dial-up ports which give access to the university computer network also give access to the library's databases. Any person with access to the campus computer system has access to the library's online catalog.

The following comments from respondents to the questionnaire illustrate this:

(]) Due to the nature of the university's network, all access from the campus is equivalent, whether in the libraries, offices or dormitories. There are now about 4000 terminal ports but the library computer can support only 18 simultaneous online catalog users. Therefore, all access has been remote since the inception of the online catalog. People are also able to dial in by telephone, but we are unable to identify such log-ins.

(2) We provide dial access and linkage through the campus academic computer. We also have dedicated terminals in teaching departments as well as a terminal in each of the 18 regional library system headquarters in the state. In addition, our circulation system is shared with 26 other academic libraries in the state, each of whom can borrow directly from our collection and also can consult our database of 890,000 MARC records as well.
The figure of 35 remote access terminals includes only the dial-up ports (10), the terminals in faculty departments (7), and the 18 regional library systems. If you include the 26 other academic libraries, we have over 400 remote access terminals, any one of which can borrow a book directly from our collection.
Total hardwired terminals on campus = 220, of which 90 are public.

(3) We have no <u>separate</u> remote access module. Every ASCII terminal on campus has access to the library catalog. There are over 300 ports and 6 sub-channels for access use.

(4) (From a library planning to install an online catalog and circulation module using NOTIS software.) The system will be on the mainframe computer of the campus. There will be 1200 direct feed terminals and hundreds of dial in ports.

If libraries have their own dedicated computers, which probably will be minicomputers, the numbers for dial-up ports will be much smaller than the numbers quoted above. For example contrast the plans for the NOTIS system quoted above with those for a GEAC online catalog with remote access facilities:

> GEAC is to provide .x25 hardware ports. .x25=10 terminals per port at 9600 BPS per terminal. The library will buy 8 ports, but will activate only 20 remotes signed on at one time.

SPECIFIC OBJECTIVES OF THE STUDY

The purpose of this study was 1) to survey Canadian and U.S. academic libraries which allow remote access to their online catalogs or online catalog substitutes; 2) to discover changes in library use patterns and library service demands by remote access terminal/personal computer users; and 3) to determine the number of users and whether this has changed over time.

METHODOLOGY OF THE STUDY

Self-administered questionnaires were sent to the directors of all ARL libraries and all libraries of Canadian degree-granting institutions, 137 in all. The questionnaire was made up of twenty questions covering such aspects of remote access as: the number of patrons who can logon at the same time, the hours of service available, time limitations on individual use, patron demand for additional service, and increased level of patron satisfaction or dissatisfaction with the service. Questionnaire is attached, Appendix A.

An attempt was made to study patrons indirectly through questions designed to elicit from library directors information about patterns of remote access terminal use gathered from the directors' informed opinions as well as statistics. After pretesting the questionnaire with staff at two libraries, the wording of some questions was changed, and the following sentences: "The following questions may be difficult to answer. Please answer if information is easy to supply. If you do not have detailed information, estimates would be helpful. Indicate estimates." were inserted between questions 9 and 10. Feedback from pretesting had indicated that some libraries, perhaps most, did not keep the data the researchers were hoping to collect, i.e., records of log-ons from remote access terminals, etc. It was decided that subjective, anecdotal information could be useful in this preliminary study of a rapidly developing library service.

Data collected about 115 libraries were coded and entered into a SPSS file. Plans to analyze this data for factors which might affect the amount of remote access use and for variables which might be affected by the amount of remote access use had to be modified because respondents could supply little of the information researchers were looking for. Remote access is still so new a service for most of the libraries surveyed that they could not give estimates.

The following report of study findings provides a description of remote access facilities and services at an early stage of their development and indicates some of the problems in collecting data.

FINDINGS

The main finding from this study is that almost all large academic libraries, members of ARL and CARL, intend to introduce remote access capabilities for their online catalogs in the near or not too distant future. The second main finding is that there is practically no evidence on which to base conclusions about the effects of remote access facilities on library services or library patrons.

There was a high response rate to the study questionnaire: 82.5% (113 replies to 137 questionnaires); 78.5% for American ARL libraries (73 of 93); and 90.9% for Canadian libraries (40 of 44). One more library was surveyed by telephone interview, and information about another library was found in a printed source, thus bringing respondent information to 115 out of the possible 138 libraries surveyed. One reason for the high response may have been the fact that the questionnaire was very easy to answer in many cases. "We have no way of gathering these sorts of statistics," "We do not keep information about session lengths" -- these were frequent comments. Libraries in general do not keep the kind of data our questionnaire was designed to collect. There was one other barrier to collecting information: time. Most of the libraries have just introduced remote access capability, some were introducing it during the summer, and there was not a long enough period of experience to permit respondents to make estimates if they did not have factual information. One respondent suggested that we write to her after six months, another suggested a year's delay.

All but one of the ARL/CARL libraries which have operational online public catalogs (in this study this includes catalog substitutes such as circulation public query modules) reported that they either have remote access facilities or will have them eventually, usually in the near future. The one library answering no to the question of future plans about remote access reported, "No specific plans." See Tables 1 to 3.

Table 1 Libraries with Online Public Access Catalogs

	ARL Libraries	CARL Libraries	Other Canadian Academic Libraries	
With OPACs	38* (52%)	12** (52%)	6 (32%)	56 (49%)
Without OPACs	35 (48%)	11 (48%)	13 (68%)	59 (51%)
	73 (100%)	23 (100%)	19(100%)	115 (100%)

*Includes one library with public access to catalog only through remote access.
**Includes two libraries with public access to catalog only through remote access.

Table 2 Remote Access Facilities in Libraries with OPACs

	ARL Libraries	CARL Libraries	Other Canadian Academic Libraries	
With RA	21 (55%)	9 (75%)	2 (33.33%)	32 (57%)
Without RA	16* (42%)	3 (25%)	4 (66.66%)	23 (41%)
Missing data about RA	1 (3 %)	-	-	1 (2%)
	38 (100%)	12 (100%)	6 (100%)	56 (100%)

*Includes 4 reported with RA in process, in test format or starting fall 1985.

Table 3 Planning for Remote Access. Libraries with OPACs/Without RA

	ARL Libraries	CARL Libraries	Other Canadian Academic Libraries	
Planning	15 (88%)	3 (100%)	3 (75%)	21 (88%)
No plans	1* (6%)	-	1 (25%)	2 (8%)
Missing data	1 (6%)	-	-	1 (4%)
	17 (100%)	3 (100%)	4 (100%)	24 (100%)

*"No specific plans" for RA.

Of the 46 ARL/CARL libraries without OPACs at the time of the survey (this includes some libraries planning to introduce OPACs in fall 1985 or early 1986), only four reported that they had no plans for the eventual introduction of remote access facilities. In Table 4 the cases with missing data represent libraries which reported plans for online catalogs but did not specifically mention plans for remote access facilities.

Table 4 Planning for Remote Access. Libraries without OPACs/Without RA

	ARL Libraries	CARL Libraries	Other Canadian Academic Libraries	
Planning	27 (77%)	7 (64%)	5 (38%)	39 (66%)
No plans	3 (9%)	1* (9%)	8 (62%)	12 (20%)
Missing data	5 (14%)	3 (27%)	-	8 (14%)
	35 (100%)	11 (100%)	13 (100%)	59(100%)

* "Considering" RA.

When the totals of operational and planned remote access facilities are added together, the percentages of university libraries which will have OPACs with RA facilities in the relatively near future are: 86% (63 of 73) for ARL libraries, 83% (19 of 23) for CARL libraries, and 53% (10 of 19) for other Canadian academic libraries. Missing data about RA plans from six ARL respondents probably would increase the percentage for ARL libraries. The forecast for ARL libraries also would be clearer if the 20 nonrespondents (21.5% of total American ARL university libraries) could be considered. Some of them are well known for their developments in automation. The conclusion, however, seems clear. In general, "What can be done, will be done." If remote access is a possible and desirable feature with an online catalog, it will be introduced by most North American university research libraries. No question in the study questionnaire asked what reasons libraries had for not planning to introduce remote access facilities. Costs may not be the only factor. As a group, Canadian university libraries which are not members of CARL are less advanced in library automation, however over 50% of them should have OPACs with RA facilities in the not too distant future if the plans they reported can be fulfilled.

ONLINE PUBLIC ACCESS CATALOGS AND REMOTE ACCESS PORTS

The 115 libraries covered in this survey are listed in Tables 1B to 6B, pages B1 to B9, Appendix B, which show catalog names, vendor names, and status of, or plans for, online public access catalogs and remote access facilities. Since the object of this study was to investigate experience with remote access links to records of a library's collection, the form of the record was not of primary importance. The term "online public access catalog" in the headings for these tables is used in a generic sense to cover public query subsystems of online circulation modules used by library patrons as online catalog substitutes. Information is given about the online catalog if this was supplied, otherwise information is given about the circulation module.

Some of the information in these tables will be accurate for a short time only. Developments in this field can be rapid. For example, one library reported in June that it had an online acquisitions database with public access, but only from remote locations. When the library was contacted by telephone in September for clarification of one questionnaire response, study researchers were surprised to learn that an online catalog had just been installed that month. The only similiarity with previous information was that the catalog like the acquisitions database could be accessed by the public only from remote locations. It was reported that access to the catalog was "practically unlimited, from approximately 800 terminals. Anyone with a terminal and modem who can access the university computer, can get through to the library." Other libraries reported ongoing changes in vendors or negotiations with several vendors. These vendors names were omitted from the tables.

The 56 libraries with operational online public access catalogs as of September 1985 are listed in Tables 1B, 3B and 5B. The catalogs can be divided into the five categories outlined on page 3: in-house developed, developed from another library's software, developed as a network project, developed by a bibliographic utility, developed by a commercial vendor. Tables 5 and 6 below give summary figures for each category and are of

interest primarily to show the distribution of profit and nonprofit (library and bibliographic utility) developed catalogs or catalog substitutes. Approximately 45% are supplied by commercial vendors. The commercial involvement is actually higher; circulation modules - frequently of commercial origin - were not counted if libraries had online catalogs. See Appendix C.

Table 5 Types of OPACs - With Remote Access Facilities

	ARL Libraries	CARL Libraries	Other Canadian Academic Libraries	Total	
(1) In-house Developed	7	3	2	12	(38%)
(2) Other Library Developed	3	-	-	3	(9%)
(3) Network Developed	5	-	-	5	(16%)
(4) Bibliographic Utility	2	-	-	2	(6%)
(5) Commercial	4	6	-	10	(31%)
	21	9	2	32	(100%)

Table 6 Types of OPACs - Without Remote Access Facilities, Summer 1985

	ARL Libraries	CARL Libraries	Other Canadian Academic Libraries	Total	
(1) In-house Developed	2	-	2	4	(18%)
(2) Other Library Developed	1	-	-	1	(4%)
(3) Network Developed	2	-	1	3	(13%)
(4) Bibliographic Utility	1	-	-	1	(4%)
(5) Commercial	10*	3	1	14	(61%)
	16	3	4	23	(100%)

*Includes one library which is changing vendors. Name not given.

OPACs in ARL libraries have a wider spread in development than those in CARL libraries; 75% of the latter were purchased from commercial vendors - all but one from one vendor, GEAC. Note: the term OPAC is used here in the generic sense to cover catalogs and catalog substitutes giving online public access to records of a library's collection.

Question six of the study questionnaire asked: "How many ports does your system make available for remote access terminals?" Twenty-nine respondents answered. The frequency table, Table 7, shows that most libraries make a restricted number of ports available for remote access, but also that there is a wide range, from one to over 300. The mean for seventeen is 4.53.

Table 7 Frequency Table for Number of Ports Available for Remote Access

No. of Ports Available	No. of Libraries Frequency	Cum. Freq.	No. of Ports Available	No. of Libraries Frequency	Cum. Freq.
1	1	1	13	1	18
2	2	3	16	1	19
3	3	6	18	1	20
4	5	11	20	1	21
5	1	12	24	1	22
6	1	13	35	1	23
7	1	14	48	1	24
8	2	16	over 50	1	25
9	1	17	64	1	26
			over 300	1	27

Two respondents for libraries which have OPACs which use shared computers replied that the number of ports was unknown.

We considered a "port" any communication line to a computer but there is no hard and fast definition for this term, and some respondents defined it as applying to dial-in access only and not hardwired lines. The comments from the second respondent quoted on page 4 above illustrate the importance of both forms of remote access facilities for a library which has extensive network connections and responsibilities. In this example remote access to both online catalog and circulation data bases is important. The answer given to question six for this library was 35 ports; this included 10 dial-up ports.

The number of ports a library system makes available for remote access terminals or computers is related only partially to the catalog categories detailed above. For example the range of number of ports provided for the ten commercially supplied OPACs (Table 5 above) is from three to eight with a mode of four, while the range of number of ports provided for the in-house developed catalogs is much larger, from five to over 300. The size of computer used and whether it is dedicated or shared, i.e., whether it is a vendor's minicomputer or the university computer centre's mainframe, are important factors in determining number of ports made available, but other factors also are important - and may have more influence in future expansion of remote access facilities - such as size and location of campus, network links, size and particular needs of user population, size and nature of database, size of database in machine-readable form. A future study might consider the growth of RA facilities and the influence of these factors.

Most libraries with remote facilities anticipate an increase in the use of these facilities apparently since 17 of the 28 respondents to the question asking whether the library intended to increase the number of ports in the near future answered "Yes." Four respondents were tentative about library plans: "maybe," "likely," "probable," "if necessary." Two responses indicated how the library's plans tied in with those of the larger university system: the number of ports will be increased "as the network expands," "as campus computing resources expand." Only five libraries reported that they had no plans for an increase in ports; these were libraries with seven, eight, thirteen, sixteen, and over 300 ports. The libraries with thirteen, sixteen, and over 300 ports have in-house developed OPACs.

It seemed reasonable in thinking about library costs connected with remote access facilities to assume that libraries would not be involved in the provision of terminals used by patrons outside the library and therefore would not have to bear any expense for the terminals. In Canada this seems to be the case. None of the ten libraries which responded to this question about the library's involvement in the provision of outside terminals reported any involvement, although one of the ten indicated that it might be involved in the provision of remote access terminals "for the Continuing Education Department in the future." In the United States several libraries are involved in the provision of terminals for remote access use: 33% (6 of 18) of the ARL respondents for this particular question. They are: Alabama, Illinois, Michigan, and three of the University of California campuses.

HOURS OF SERVICE FOR REMOTE ACCESS

Writers describing the potential of remote access facilities have pictured a night-owl patron who likes to work late and who is able to have access to the library's catalog at any hour of the day or night. Not all libraries with RA facilities are ready for this service. Nine of the twenty-five respondents to the question about hours of service reported that RA service was available for approximately sixteen to seventeen hours, with variations in time spans from 7 or 8 A.M. (one library reported 5 A.M.) to 11 P.M. or midnight every day. Some reported shorter hours available on Saturdays and Sundays. One library reported that RA services were offered from 8 A.M. to 10:45 P.M. Monday to Thursday, but continuously from 8 A.M. Friday to 10:45 P.M. on Sunday. Eight reported twenty-four hour service, seven days a week. Five did not give exact hours: they reported that the hours of service for RA are the same as for regular online access within the library. One exception to the general pattern of hours was given by a library which provides remote access service only from 4 P.M. to 11 P.M. during the week, Monday to Friday. It returns to a more usual pattern on the weekend with RA service all day Saturday and Sunday. One library said that RA service was dependent on system availability.

At this stage of development of remote access service, there is little tendency to impose time limitations on the individual user's sessions. Only four of twenty-five respondents (16%) impose time limitations. Six did report a fifteen minute time limit - in one case this was increased to twenty minutes per session after 8 P.M. - but two of these libraries do not impose a real limitation. They reported: "15 minutes, however only requires pressing return to start new session, and "15 min. (user can then immediately sign on again)." Three libraries reported that they had installed automatic log-offs after a certain number of minutes (7 or 8) of idle time, i.e., "no activity

disconnect" or "anti-camping limit." These are not time limitations. One library did report a rather effective one: "No limitations: users are charged connect time."

Questions ten to nineteen in the last part of the questionnaire were designed to gather data about libraries' experience with RA facilities and had low response rates. Researchers realized from preliminary reading and from the instrument pretest that these were difficult questions and that factual evidence might not be available yet they hoped that some libraries with several years experience could give reasonable estimates. There are three problems: first, libraries do not keep this data; common responses were N/A, no way of gathering or determining these sorts of statistics; second, even when some statistics or estimates were available, usually the libraries did not differentiate between in-library terminal use and remote access terminal use; third, the development of remote access facilities is still too new for many libraries to give reasonable estimates.

EXTENT OF RA USE - LENGTH AND NUMBER OF SESSIONS

Questions ten and eleven were intended to discover average length of time per session for all online catalog users and for all remote access catalog users. Questions twelve and thirteen were meant to reveal the number of search sessions for all online catalog users and for all remote access catalog users annually over the last five years when applicable, and monthly for 1985. These questions were difficult to answer because most systems have not been designed to record such data. Questions could have been better expressed: time "per session" instead of time "per log-on" since users do not always have to log-on to begin a session. But even with this change the data would not have been available for most systems. For example, Tolle, in his transaction log analysis study of four major systems: Dallas Public Library, Syracuse University, Ohio State University, and the Library of Congress, found that "session determinates, i.e. session length (when a user begins a session and then ends the session [were] not captured"[6] on the system transaction logs of three of the four systems studied. The Library of Congress has a log-on and log-off procedure but there are still problems: the log-off is not compulsory. To get data about session beginnings and endings Tolle had to hire observers for Ohio State and to try to persuade Syracuse patrons to begin sessions by typing S-blank (the majority did not comply). The answer to the first question in Tolle's conclusions is of interest for this study:

> QUESTION 1 How much time did patrons spend at the terminals?
> ANSWER For the Library of Congress . . . no time stamps are available, thus we do not know anything about elapsed time within a session. . . . For OSU, the average terminal session length ranged from just under 4 minutes to over 9 minutes, depending on the library branch. . . . For Syracuse, the median session time was 3.55 minutes, and the mean session time was 6.1 minutes. . . . For Dallas, the time was recorded only to the minute, but the median session was around 3 minutes.[7]

On a previous page of his report Tolle writes: "The amount of time spent at the terminals was not available with any accuracy except at the Ohio State University, where it ranged from an average of approximately 4 minutes to over 9 minutes, depending on the library considered."[8]

In response to the question about average length of time per session for all online catalog patrons, five libraries reported estimates of time (in minutes): 3, 3-5, 4, 10, 20; four reported actual average times: 9:17, 11, 11:22, 11:53. When the responses for actual times were considered it became evident that this question was more complicated than it was intended to be. The question should have been more specific and defined, or asked, what period of time the average covered. The University of California at Berkeley reported: "The average session reported by the University's Division of Library Automation was 9 minutes and 37 sec." The University of California at Davis reported: "11 minutes 53 sec. (based on statistics compiled for all University users for the month of May 1985)." What period of time is covered in the Berkeley average? Does time of year make a difference in session lengths? We have to ask: a) are the kinds of searches being conducted and the patrons doing the searches approximately the same in May as they are in December or January, etc., and if they are not, do these changes affect the average time spent per session? b) are there seasonal demands on computer time as well as the usual daily variations that affect computer response time and therefore time per session?

The average time reported by the University of California at Riverside (without defining period of time covered), 11:22, is closer to that of the Davis campus than to the time reported at the Berkeley campus. These actual times are all longer than those reported above by Tolle. Syracuse University Library, one of the libraries in Tolle's study, reported an estimated average time of 3 to 5 minutes per session for all online catalog users, a time which is less than but close to the average Tolle found for Syracuse patrons in 1982. The Syracuse respondent did suggest that time for remote access users might be longer: "probably longer - many faculty use from home with dial-up." It is interesting that the estimates of average time per session are, in general, lower than the actual averages.

For the question asking about the average length of time per session for remote access patrons, there were two more respondents than there were for the question about all online patrons. These two were libraries which offer public access to their online catalogs from remote access locations only. One of them reported an average time of 10 to 15 minutes; the other estimated an average time of 5 to 20 minutes. Little other new information was given for this question. Dartmouth and the University of California at Berkeley reported that they do not differentiate between in-library and remote access terminals. University of California libraries at Riverside and Davis had to reply: data N/A. Riverside has had relatively little experience with remote access as yet (see Appendix D), and Davis remote access use did not begin until the end of summer, 1985. Illinois and Northwestern gave the same estimate of average time for both in-library use and remote access use. Respondents for two libraries believe that remote access session length is probably longer; Syracuse as reported above, and Ottawa which reported an estimate of 5 minutes compared to an estimate of 3 for all online users. One library, Carleton, estimated that remote access average times are less than in-library times; an average time of less than 5 minutes compared to an average time of 10 minutes per session in library. Carleton had some basis for this estimate. It conducted a study of remote access use, and one of the questions in its questionnaire was, "When you were last accessing CUBE, how long were you logged-on for?"

No conclusions can be drawn from such limited and unavoidably speculative data, except that a limit of 15 minutes may be adequate for most users. When this is said, however, Stanford's response to both questions is interesting: "Average unknown. Ranges from single citation to hour plus."

As noted above, the questions requesting information about number of log-ons, i.e., number of sessions, for all online public access users and for remote access users (annually up to 1985 and monthly average in 1985), were problem questions and they received problem answers. Eleven libraries provided some information; the most detailed was supplied by Ohio State University. This university does not keep statistics for number of sessions, but it does for the number of transactions made by users and was able to give actual figures for transactions which they defined as "each press of enter key." From these figures percentages could be derived which showed an annual increase in activity by online users generally and by remote access users in particular. An increase in the record of transaction activities should mean an increase in the number of separate sessions, although it could mean longer sessions rather than an increase in their number. Users' increasing sophistication could result in more efficient shorter sessions or in more effective longer ones. Table 8 below shows that there has been a continuing increase in the number of transactions for all Ohio State University online catalog users from 1981/82 to 1985 with a particularly large increase in 1982/83, and that the percentage of increase in the number of transactions for remote access catalog users is larger than the total percentage increase, dramatically so in 1985. Remote access catalog use appears to represent a very small fraction of all OSU online catalog use.

Table 8 Number of Transactions in OPAC Use, Generally and by Remote Access at Ohio State University

Year	No. of transactions - all online	Percentage increase	Monthly average	No. of transactions -remote access	Percentage increase	Monthly average
1981/82	6,729,099*	-	560,758.3	25,000*	-	2,083.3
1982/83	10,025,432*	48.98%	835,452.7	43,700*	74.8%	3,641.6
1983/84	11,345,991*	13.17%	945,499.2	70,000*	60.2%	5,833.3
1985	-	-	1,000,000*	-	-	30,000*

*Figures supplied by OSU.

Some libraries were able to record exact figures for number of log-ons, or number of sessions. For example, three University of California campuses gave monthly figures for the number of sessions for all online catalog patrons: Riverside (April 1985), 10,444; Berkeley (May 1985), 108,000; and Davis (May 1985) 8,418. Texas A. & M. University gave total figures (January to May 1985) for the number of sessions for remote access patrons, 12,201 - a monthly average of 2,440.2. These libraries, however, were unable to supply figures for comparisons with the number of sessions in previous years, or, in the case of California libraries, with the number of sessions by remote access patrons and, in the case of Texas A. & M.,with the number of sessions for all online catalog patrons. No figures for annual and/or monthly sessions were available from Syracuse although remote access sign-ons were checked the day the study questionnaire was completed. There were sixty-five sign-ons between 8 A.M. and 2:30 P.M. on June 20, 1985. The respondent at Syracuse reported that "use is very heavy in regular semesters" for all online patrons and "use is very much higher in winter semesters" for remote access patrons. Except for the figures supplied by Purdue and Carleton Universities and given in the following paragraphs,other reports of numbers of sessions appear to be estimates. Northwestern reported approximately 36,000 "searches" in 1984/85.

Five libraries, including Ohio State (see Table 8 above), gave data covering more than one year. Dartmouth's monthly average number of sessions for all OPAC patrons in 1985 was 4300. The estimates for earlier years were much lower: 500 per month in 1983 and 1,000 in 1984. No estimates were given for the number of sessions by remote access patrons. Dartmouth does not distinguish between in-library and remote access use. Stanford's estimates were similar to Dartmouth's except for the period of time covered: 500 sessions a day in 1983, 1,000 a day in 1984. No estimates were given for the number of sessions by remote access patrons. The fourth library, Purdue, reported a total of 75,300 sessions for all online catalog users in 1984 and a monthly average of 4,645 in 1985. This appears to be a drop in use. For dial-up access the figures given were 21 [?] for 1984, and 17.5 for the monthly averages in 1985. Since about fifty percent of the total (75,300) for all online users represents outside library use, RA use by dial-up access at Purdue must be much less than RA use through dedicated lines. The fifth library which gave data covering more than one year was the University of Waterloo. Here the trend of increasing public use of the online catalog was reversed. All public access to the Waterloo online catalog is remote access. The estimates for number of sessions per year were: 17,000 (1982/83), 15,000 (1983/84), and 8,000 (1984/85 - fiscal year, May to April). There are a number of explanations for the decline in use. The novelty of the service in the first year attracted many users but the novelty wore off, and some users found problems in using the catalog. Waterloo has only three remote access ports; users trying to get on to the system were frustrated and some stopped trying. Another reason for the overall drop in use was the decision to charge outside institutional borrowers. This has improved service for Waterloo's own patrons. 9

The last library to be mentioned is Carleton's. This library participated in iNET, a project covering a number of online information sources. Its catalog was available to remote access users for a charge of $20.00 per hour via Telecom Canada iNET service. Carleton's iNET service began in 1984 and in that year there were 284 iNET log-ons; the average number of sessions per month in 1985 has been 33. The 1985 monthly average for other RA patrons has been 112.

These reports illustrate problems in measuring the amount of use of RA access. This is not a priority for most libraries at present. A number of responses indicated that this information is not availabe but will be in the future.

LOCATION OF REMOTE ACCESS USERS

The question concerning location of RA users was meant to discover what percentage of RA use is accounted for by a university's own clientele (campus users), by neighboring institutions within a community and their clientele (off campus but within a direct borrowing radius), and by users from much farther afield who would have to use interlibrary loan if they wished to borrow materials (off campus users beyond direct borrowing radius). Again a question for which libraries have no statistics - ten respondents made estimates. Seven of the ten estimated the library's own clientele to be 90 to 99% of RA patrons. One respondent estimated this group to be 80%, another as 70% and one as 30%. The library for which the latter estimate was made is an ARL library where the only public access is by remote access, possibly the library has close links with community institutions since the estimate for RA users in this group was 70%. Few thought the third group would be of any significant size; only four of the ten respondents even suggested any percentage of RA users would belong to this group. There is a problem of definition between groups two and three; what is direct borrowing radius? Syracuse reported: "We have had increasing demand for access from area libraries, from those close by to those approximately fifty miles distant. Telecommunications costs are the major problem." Syracuse reported zero for RA use by users in the third group. One library changed questionnaire categories and reported 52% of RA use is by university affiliated users, 44% is by other institutions and 4% by users in other categories.

CATALOG INFORMATION AVAILABLE TO RA PATRONS

In the majority of libraries RA users have access to the same information which is available to users of the library's in-house terminals. One library reported additional service for RA users: "added features to download/transfer/mail citations are available through remote access." Four libraries in this study do not provide RA users with information about circulation status which is available with terminals inside the library. In one library RA patrons have no subject access or boolean search capability, and in another, in-library terminals provide more detailed information, i.e., more bibliographic fields. These seem to be temporary stages in the development of RA facilities.

RA - SERVICE DEMANDS AND/OR COMPLAINTS

Additional services that might be in demand by RA users were identified in the study as document delivery, changes in catalog description, and "other". Five libraries reported requests for document delivery. Three already provide document delivery (one since 1970) though it is not clear to what extent; one respondent noted that this service is available to faculty. As for changes in catalog description this question elicited only negative answers. "Other" demands were given as follows: "lots of requests for expansion of the service;" "interest in iNet in having us as an information provider;" "more dial-up ports;" "interest in charging books from remote terminals, also saves and renewals."

Several libraries added comments as follows:
"we require more main frame support so that expansion will not affect our response time;"
"suggestions for message/hold mechanism;"
"PAM uses a standard monitor display (80 characters by six lines). Had requests from users with home micros for displays that will fit on smaller screens;"
"the system currently searches and displays tables of contents added to many bibliographic records. Users want more of the record to contain such enhancements;"
"the availability of remote access has litte or no influence on demand for service as far as we know (a subjective assessment only)."

There were few complaints listed by respondents. Essentially patrons want more access - more ports. Comments included: "would like to add 1200 and 300 Baud rates for home PC use, we are doing this in the fall;" "remote kept to 3 ports, complaints about difficulty of remote access only."

EFFECT OF RA SERVICE ON CIRCULATION AND INTERLIBRARY LOAN

No library could see any relationship between increases or decreases in circulation and interlibrary loan and the introduction of RA facilities.

LOCAL STUDIES

The final question asked about local studies to examine the effect of RA on library use and services. Two libraries have conducted studies. Waterloo did a survey on satisfaction with the RA module but did not relate this to library use and services. Carleton's survey was described as follows: "Remote access users who have used the online catalogue for more than six months were asked to complete a CUBE user questionnaire. The questionnaire covered various areas of online catalogue use such as: index and command usage; issues related to access; instructional features; ranking of planned enhancements. Due to respondents'high priority on introducing circulation information through CUBE, we made this feature available sooner than originally planned." These studies are for internal use.

CONCLUSION

This study of university library experience with remote access catalog users was undertaken to provide answers to practical questions such as: when remote access service is made available, how much use is made of this, what effect does it have on other library services, does it lead to requests for expensive additional services such as document delivery, does it increase problems such as slow response time.

At the completion of the study there are no firm answers. Response to the questionnaire was high, 82.5%, but the amount of information respondents could supply was limited. Only 27% of respondents (32 of 115) now offer remote access facilities, and for many of them the service is still very new. The key problem in data collection was the fact that most libraries could not report how much use is made of their remote access facilities, i.e., how many

users there are and how long they spend online. Berger called the session summary "the basic building block of all statistical data gathering"[10] but most libraries do not keep these statistics, and if they do, they do not distinguish between in-library and remote access users. An online catalog such as the University of Manitoba's inhouse developed catalog introduced in September 1985 could provide such statistics. It was designed for computer monitoring for transactional log analysis studies. Librarians will be able to count the number of sessions per user, and -within each session - the number of searches per user and the kind of search:author, title, subject, and search strategy.[11]

Remote access appears to have produced no major effect on libraries so far. There is the general demand for more, i.e., more ports, and there have been some requests or suggestions for document delivery. No respondent found any relationship between changes in circulation or interlibrary loan statistics and the introduction of remote access service.

FOOTNOTES

1. Brian H. Aveney, "Online Catalogs: the Transformation Continues," Wilson Library Bulletin. LVIII (Feb., 1984), 406.

2. Frederick G. Kilgour, "Online Catalog Revolution," Library Journal, CIX (Feb. 15, 1984), 321.

3. Stanley Beacock, former Chief Librarian, London Public Library, Personal Communication, Fall 1985.

4. University of Western Ontario, Library Newsletter (Aug., 1985), p.1.

5. Ibid.

6. John E. Tolle, Current Utilization of Online Catalogs: Transaction Log Analysis. Dublin, Ohio: OCLC, Inc., 1983. p. 2.

7. Ibid, p. 105.

8. Ibid, p. 4.

9. Caroline Presser, Associate Librarian, Planning and Systems, University of Waterloo, Personal Communication, Fall, 1985.

10. Mile Berger, "A Large University On-line Catalog, One Year Later." (In American Society for Information Science. Conference, Columbus, Ohio, 1982. Proceedings, XIX, Information Interaction. Knowledge Industry Pubs. for ASIS, 1982.

11. Patricia Nicholls, Head of Technical Services, University of Manitoba, Personal Communication, Fall 1985.

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APPENDIXES

APPENDIX A

University Library Experience with Remote Access Terminals

1. Has your library an online public access catalog or an online catalog substitute, i.e., an online public query circulation module? _____

2. Name/s of system/s: online catalog (vendor) _____

   Circulation module (vendor) _____

3. Has your system put into operation a remote access module to your online catalog or online catalog substitute? _____

If answer to question 3 is Yes, continue to questions 5-16: if No, stop after question 4.

4. Are you planning to put into operation a remote access module in the near future? _____

5. How many ports does your system make available for remote access terminals? _____

   Do you intend to increase this number in the near future? _____

6. Is the library involved in the provision of remote access terminals? _____

7. What are the hours of service for remote access terminals? _____

8. Are there time limitations for individual use? _____

   If answer is Yes, what are these limitations? _____

   _____

9. Have remote access terminal users access to the same information which is available to public users of the library's inhouse terminals? _____

   Comments _____

   _____

   _____

   _____

The following questions may be difficult to answer. Please answer if information is easy to supply. If you do not have detailed information, estimates would be helpful. Indicate estimates.

10. What is the average length of time per log-on for all online catalog users?

    _____

(continued...)

11. What is the average length of time per log-on for remote access terminal users?

_____

12. What is the total number of log-ons for all online catalog use?

	1980	1981	1982	1983	1984
(Annually):	____	____	____	____	____

Monthly average for 1985: _____

13. What is the total number of log-ons for all remote access use?

	1980	1981	1982	1983	1984
(Annually):	____	____	____	____	____

Monthly average for 1985: _____

14. Estimate the overall percentage of remote access terminal log-ons attributable to:

On campus users _____

Off campus users, but within a direct borrowing radius _____

Off campus users beyond direct borrowing radius _____

15. Have these proportions changed over the above period of years? _____

Comments _____

_____

_____

_____

16. Since the introduction of the remote access module, has the library had demands for additional services such as the following:

Document delivery _____

Changes in catalog description _____

Other _____

Comments _____

_____

_____

_____

(continued...)

17. Since the introduction of the remote access module, has the library had increased complaints about online services such as the following:

Queuing _____

Response time _____

Other _____

Comments _____

_____

_____

_____

18. Have circulation statistics increased, decreased, or remained basically the same since the remote access module has been available? _____

Is there a relationship between circulation statistics and remote access facilities? _____

_____

19. Have interlibrary loan statistics increased, decreased, or remained basically the same since the remote access module has been available? _____

Is there a relationship between interlibrary loan statistics and remote access facilities? _____

_____

20. Has your library conducted any local studies to examine the effect/s of remote access terminals on library use and services? _____

_____

_____

_____

Table 1

CANADIAN UNIVERSITY LIBRARIES (CARL MEMBERS)

WITH ONLINE PUBLIC ACCESS CATALOGS

Name of University	Name of system/vendor	Remote access facilities
University of Calgary	DOBIS/LIBIS (IBM)	Yes. Pre-selected users, depts.
Carleton University	CUBE (Carleton University's Bibliographic Enquiry)	Yes
University of Guelph	GEAC	Yes
University of Manitoba	In-house developed. Public access only outside library	Yes
University of New Brunswick	PHOENIX In-house developed.	Yes
University of Ottawa	GEAC	Yes
Queens University	GEAC	Yes
University of Saskatchewan	GEAC replacing in-house online public query (circ.)	Will be available
Simon Fraser University	GEAC	June 1986
University of Waterloo	GEAC	Yes. Only public access.
University of Western Ontario	GEAC	Pilot study 1985/86, limited to campus offices.
York University	GEAC	Yes

Table 2

CANADIAN UNIVERSITY LIBRARIES (CARL MEMBERS)

WITHOUT ONLINE PUBLIC ACCESS CATALOGS (Summer 1985)

Name of University	Plans for OPACs	Plans for Remote access
University of British Columbia	In-house dev. online system not yet public. Uses campus network which provides access for both incoming and outgoing calls of many kinds. Access for outside users (users of terminals outside of those provided by university) is a matter of policy.	--
McGill University	Negotiating with three vendors. Plan OPAC early in 1986.	Spring 1986
Concordia University	Yes. Distant future?	Yes
Dalhousie University	Yes. Consortium of 5 metro Halifax universities. Possibly implemented in 1986. Vendor negotiations.	Yes
Université Laval	Probably 1986/87.	--
McMaster University	In earliest planning stages for OPAC & RA. Have in-house dev. online system for staff query.	Yes
Memorial University of Newfoundland	CLSI LIBS-100 for staff query.	Considering
Université de Montreal	--	Planning remote access in two years.
University of Regina	At beginning stages of planning.	--
University of Toronto	--	Yes. Not near future?
University of Windsor	--	Yes. Not near future?

Table 3

OTHER CANADIAN ACADEMIC LIBRARIES
WITH ONLINE PUBLIC ACCESS CATALOGS

Name of institution	Name of system/vendor	Remote access facilities
Acadia University	PAM. In-house dev. Mainframe.	Yes
Brandon University	Brandon University Catalogue. In-house dev. Mainframe.	Yes
Brock University	GEAC, July 1985.	Planned for later
Ryerson Polytechnical Institute	DOBIS (Centennial College Bibliocentre)	No plans
Trent University	Public access module to Serials Sept. 1985. In-house developed.	Probably 1986
Wilfrid Laurier University	In-house developed. Uses university mainframe. Access to circulation file available fall 1985.	In near future

Table 4

OTHER CANADIAN ACADEMIC LIBRARIES
WITHOUT ONLINE PUBLIC ACCESS CATALOGS

Name of institution	Plans for OPACs	Plans for remote access
Bishop's University	--	In two years
Lakehead University	Not yet.	Yes. Distant future?
Laurentian University of Sudbury	No.	No
University of Lethbridge	No.	No
Université de Moncton	Online public query circulation module in a year or two.	No
Mount Allison University	No.	No
Mount St. Vincent University	See St. Mary's.	Yes
University of Prince Edward Island	--	No
St. Francis Xavier University	In-house circulation module being developed.	No
St. Mary's University	Consortium of 5 metro Halifax universities. OPACs possibly installed in 1986. Vendor negotiations.	Yes
Technical University of Nova Scotia	See St. Mary's.	Yes
University of Victoria	No.	No
University of Winnipeg	No.	No

Table 5

AMERICAN UNIVERSITY LIBRARIES (ARL MEMBERS)
WITH ONLINE PUBLIC ACCESS CATALOGS

Name of University	System name/Vendor	Remote access facilities
University of Alabama	VTLS (Virginia Tech Library System	Yes
University of Arizona	GEAC circulation module	Near future
University of California, Berkeley	MELVYL (University of California)	Yes
University of California, Davis	MELVYL	Beginning summer or fall 1985, initially limited to faculty.
University of California, Irvine	MELVYL. CLSI circ.	Yes
University of California, Los Angeles	ORION (in-house)	Yes
University of California, Riverside	MELVYL	Yes
University of California, Santa Barbara	MELVYL	Near future
University of Chicago	In-house developed	No specific plans
University of Cincinnati	Changing to BLIS (Biblio-Techniques)	In test format limited to staff.
University of Colorado	CARL (Colorado Alliance of Research Libraries - network of six libraries) - locally developed OPAC.	Yes
Columbia University	BLIS. In process.	In process
Dartmouth University	In-house developed. Uses BRS for searching.	Yes
Duke University	System being developed. BIS (Bibliographic Information System), TRLN (Triangle Research Libraries Network)	Yes: planning
University of Florida	NOTIS (Northwestern University)	Yes

(continued...)

Name of University	System name/Vendor	Remote access facilities
Florida State University	CLSI (CL Systems, Inc.)	Near future
University of Georgia	MARVEL (locally developed)	Near future
University of Illinois	WLN software. LCS (Ohio State Univ. Circulation)	Yes
Johns Hopkins University	(Changing vendor)	Near future
University of Maryland	GEAC	Dial-up in process
University of Michigan	GEAC	Yes
Michigan State University	CLSI	Yes
University of Missouri	Locally developed. WLN software.	Near future
University of New Mexico	ALIS II (circ.) DataPhase.	Remote access currently the only public access.
New York University	GEAC	Near future
Northwestern University	LUIS (Northwestern University)	Yes
Ohio State University	LCS (Library Control System)	Yes
Purdue University	EIS. Locally developed.	Yes
University of Rochester	GEAC	Spring 1986
Rutgers University	GEAC	--
Southern Illinois University	LCS ("Library Computer System", as dev. for Illinois libraries)	Near future
Stanford University	SOCRATES (in-house developed)	Yes
State University of New York at Albany	GEAC	Fall 1985
Syracuse University	SULIRS (in-house developed)	Every ASCII terminal on campus has access. Over 300 ports.
Temple University	GEAC	Near future
Texas A&M University	ALIS II (circ.) DataPhase	Yes
Washington State University	In-house dev. WLN software.	Yes
Washington University	NOTIS?	In future

Table 6

AMERICAN UNIVERSITY LIBRARIES (ARL MEMBERS)
WITHOUT ONLINE PUBLIC ACCESS (Summer 1985)

Name of University	Plans for OPACs	Plans for remote access
Arizona State University	--	No
Boston University	Yes. Vendor confidential.	Yes
Brigham Young University	NOTIS being installed.	Yes
Brown University	Planning to install Biblio-Techniques. This system makes no distinction between library terminals and dial-in ASCII terminals.	Yes
Colorado State University	--	No
University of Delaware	--	No
Georgetown University	GEAC being installed.	--
Georgia Institute of Technology	--	Yes
Harvard University	--	Yes
Howard University	--	Yes
Indiana University	BLIS (Biblio-Techniques) being installed.	Yes
University of Iowa	--	Yes, 1990.
Iowa State University	In planning stages.	--
University of Kentucky	OCLC LS/2000 being installed fall 1985.	Yes, fall 1985
Louisiana State University	NOTIS within 4 months.	Yes
University of Massachusetts	Installing OCLC LS/2000.	Yes
Massachusetts Institute of Technology.	GEAC. Limited, by fall 1985.	Yes
University of Minnesota	--	Eventually, not near future.
University of Nebraska	--	Yes

 (continued...)

Name of University	Plans for OPACs	Plans for remote access
University of North Carolina	BIS (Bibliographic Information System), TRLN (Triangle Research Libraries Network) local network development. To be introduced fall 1985.	Yes
North Carolina State University	See University of North Carolina and Duke University.	Yes
University of Notre Dame	--	Yes, 12-24 months
Oklahoma State University	Planning for Jan. 1986. System name not available.	Jan. 1987
University of Oregon	--	In planning stages. Implementation in 1 or 2 years.
University of Pittsburgh	--	--
Rice University	CLSI circ., but no public query allowed.	Installing NOTIS this year.
State University of New York at Stonybrook	--	Yes
University of Tennessee	GEAC. Staff access only at present.	OPAC (and RA?) in summer 1987
Tulane University	DataPhase circ. Staff access only.	--
University of Utah	CLSI LIBS-100. Staff operated. No public terminals in library.	Planning for RA in near future, but at present outside callers can call in to circulation inquiry. No way of knowing.
Vanderbilt University	Northwestern U. system (LUIS?) Fall 1985.	Within a year
University of Virginia	In-house dev. circulation system. Not true public access. Plan for integrated system and OPAC 1986/87.	Have remote access but not directly by public.

(continued...)

Name of University	Plans for OPACs	Plans for remote access
Wayne State University	Contract negotiations with GEAC.	Yes, in six months
University of Wisconsin	Installing in-house developed system.	Yes, but distant future.
Yale University	No OPAC at present. Considering a turnkey system.	--

APPENDIX C

OPACS SUMMARIZED IN TABLES 5 AND 6

Category 1, OPACs developed in-house:

U.S. - ORION(UC, Los Angeles), Chicago, Dartmouth, MARVEL (Georgia), LUIS (Northwestern), LCS (Ohio State), EIS (Purdue), SOCRATES (Stanford), SULIRS (Syracuse).

Canada - PAM (Acadia), Brandon, CUBE (Carleton), Wilfrid Laurier, Manitoba, PHOENIX (New Brunswick), Trent.

Category 2, OPACs developed from another library's software:
VTLS (Alabama), NOTIS (Florida and Washington) and LCS (Southern Illinois).

Category 3, Network developed OPACs:
CARL (Colorado), BIS (Duke), MELVYL (University of California campuses) and DOBIS (Ryerson). The Universities of Calgary and Alberta purchased their DOBIS/LIBIS system from the original commercial developer, IBM, but the version used by Ryerson was developed by Centennial College Bibliocentre for a consortium of college libraries. CCB purchased DOBIS from the National Library of Canada and acquired the LIBIS circulation system developed for the Catholic University of Leuven.

Category 4, Bibliographic Utility linked OPACs: three OPACs using WLN software.

Category 5, Commercial vendors of OPACs:
Biblio-Techniques (BLIS), CLSI, DataPhase (ALIS II), GEAC and IBM(DOBIS/LIBIS).

APPENDIX D

EXAMPLES OF TWO LIBRARIES WITH THE SAME FORM OF ONLINE CATALOG, BUT DIFFERENT NUMBERS OF PORTS.

This Library uses MELVYL, the UC online union catalog which was developed by the Division of Library Automation, which reports to the Assistant Vice President for Library Plans and Policies . . . We currently have thirty (30) terminals attached to a terminal access controller, and one port limited to a Develcon Data Switch operated by the campus Academic Computing Center. This port allows any user on campus who has a terminal wired to the switch access to MELVYL. The switch also has several dial access ports, so that users may dial into the switch.

With just a single port, our experience with remote access is limited. We are planning, however to add up to eight ports on the Develcon switch during the next fiscal year. We have had complaints that users can not get on the MELVYL through the switch because it is always busy.

Excerpt from letter by John W. Tanno, Associate University Librarian, University of California, Riverside.

It is now possible to access the MELVYL library information database system from the CFC port selectors. Several other UC campuses have already installed communication lines to connect users' terminals to the Systemwide computer which contains the MELVYL database; the service was added at Berkeley on May 10, 1985. . . . To access the MELVYL system, the terminal you use must be operating at either 1200 or 9600 baud. If you are dialing up, use . . . To be connected to a MELVYL port simply respond to the "Request" prompt with MELVYL.

There are only two ports at each speed on each port selector (eight ports total). This is obviously a scarce resource, and it is not possible to acquire more ports at this time. Therefore we ask that users please not stay connected to the MELVYL system any longer than necessary. As a rule, 15 minutes should be the longest continuous session.

David Wasley, "Access to MELVYL from the Port Selectors," Academic Computing Newsletter, VIII (June 1985), Number 6, p. 5.

UC, Berkeley reported twenty-four ports on study questionnaire.